# Armed Forces College of Medicine

## AFCM

Pleura

# Arterial Anastomosis of Lower Limb


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**Ass. Prof of Anatomy**

# INTENDED LEARNING OBJECTIVES (ILO)

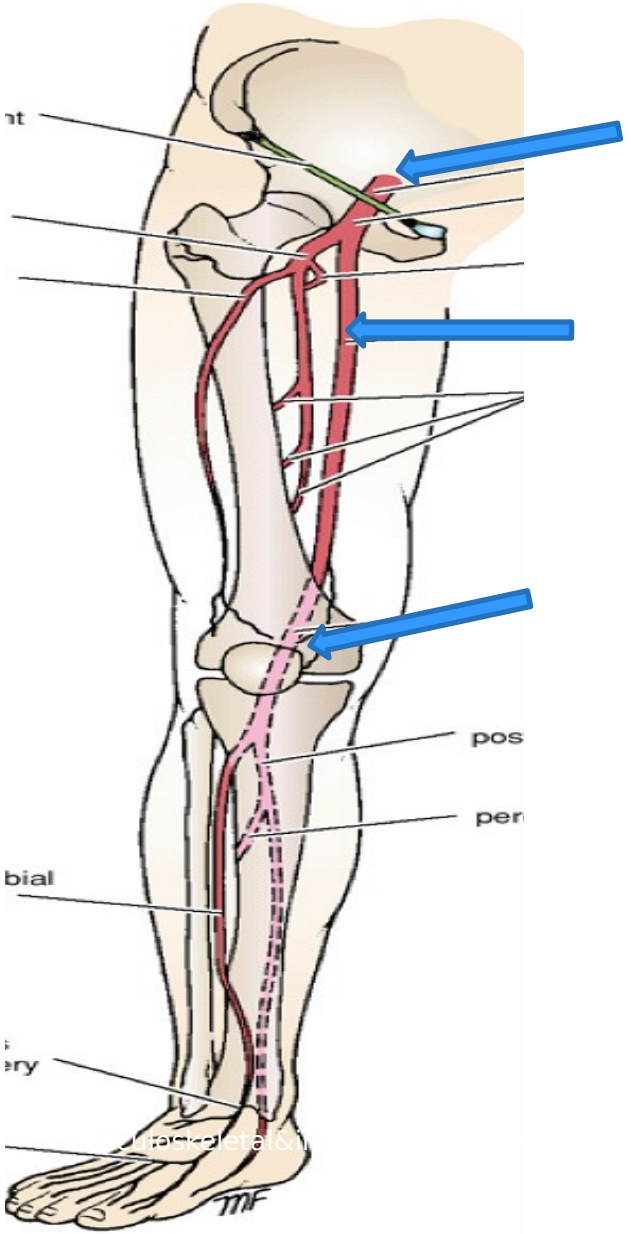
By the end of this lecture the student will be able to:

1. Discuss the arteries sharing in anastomosis around trochantric, cruciate, back of thigh, knee and ankle
2. Predict the clinical significance of anastomosis of lower limb.

# Femoral Artery

***Origin:***

*Continuation of* ***external iliac artery.***




- ***Termination:***

*enter the Back of the knee and will continue as* ***popliteal***

# Branches of Femoral artery

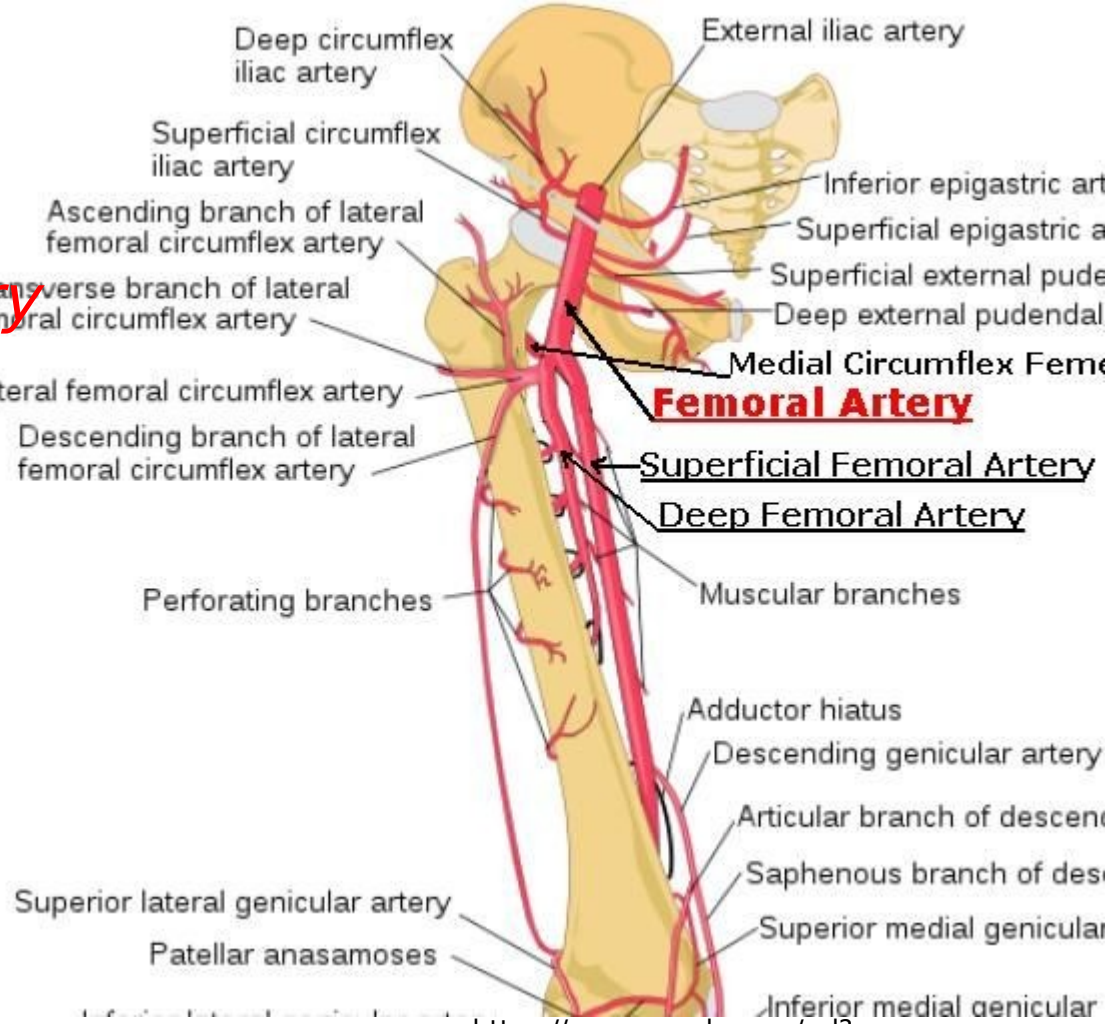
## 1) The superficial branches:

*a) Superficial epigastric artery*
*b) Superficial external pudendal artery*
*c) Superficial circumflex iliac artery*

## 2) The deep branches:

*a) Deep external pudendal*
*b) Descending genicular artery*
*c) Profunda femoris*

- ***It gives:***
  - *Medial & lateral circumflex femoral arteries.*
  - *3 perforating arteries.*
  - *It ends as 4th perforating artery.*

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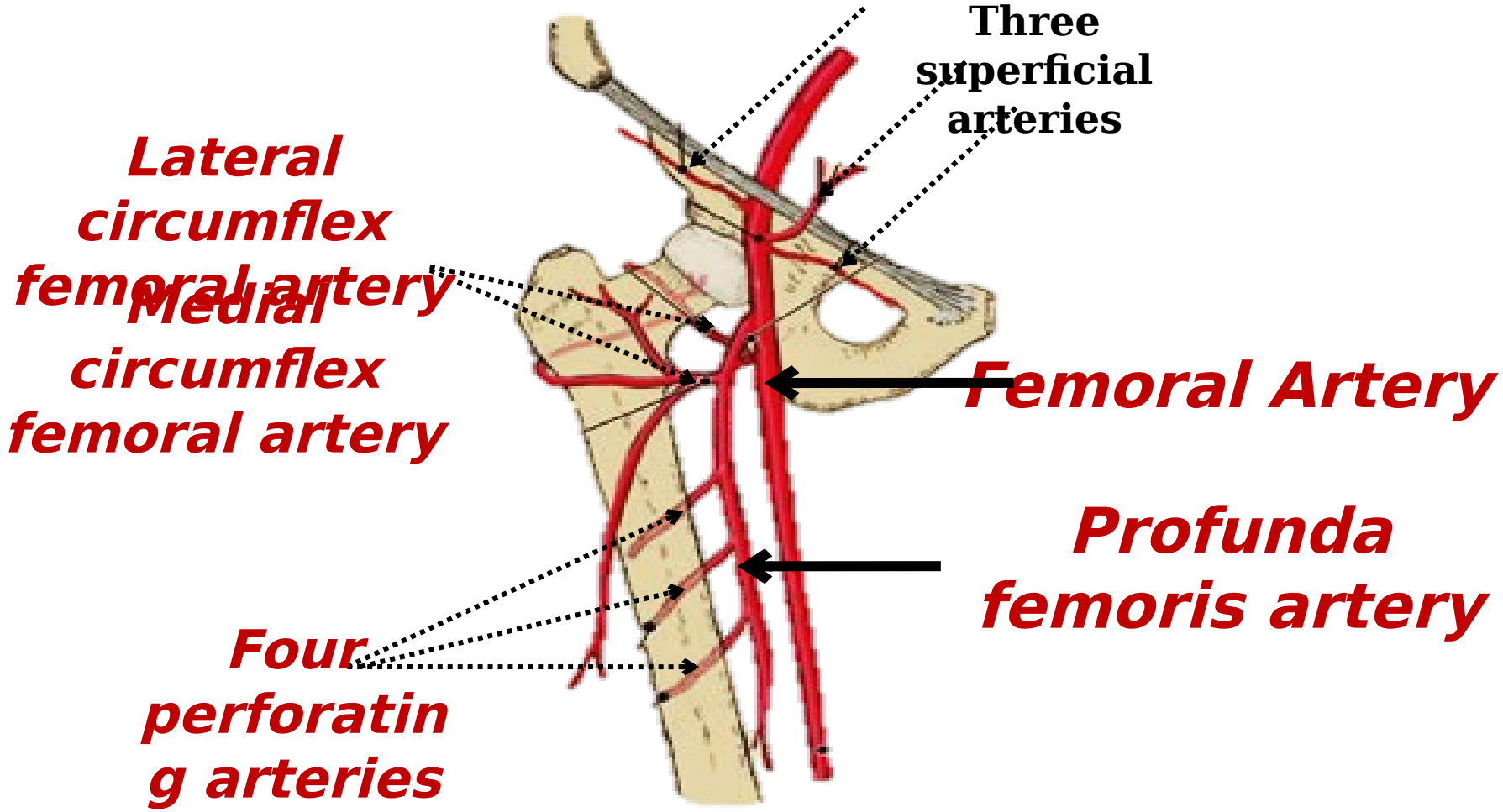
# Branches of Femoral artery

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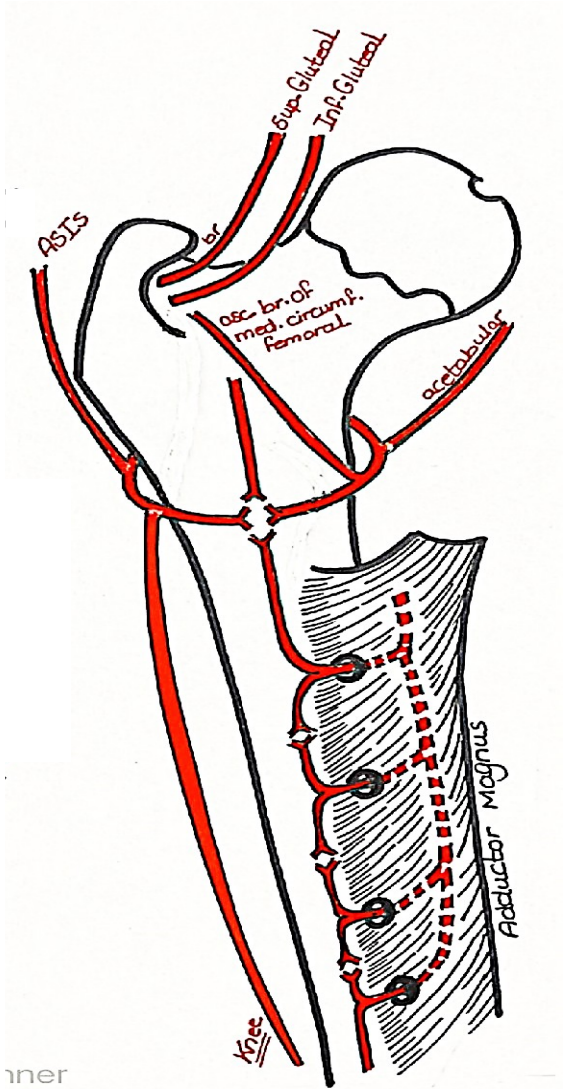
## Lateral circumflex femoral

**Ascending Br.** → ASIS #

**Transverse Br.** → cruciate #

**Descending Br.** → # knee




## Medial circumflex femoral

**Ascending Br.** → trochanteric #

**Transverse Br.** → cruciate #

**Acetabular Br.** → acetabulum & ligament of head of femur

# Cruciate Anastomosis

- **Site:**

**upper part of back of thi**

- **Formation:**

***Vertical limb.**

**1 . Desc. Br. of Inf gluteal**
*(internal iliac )*

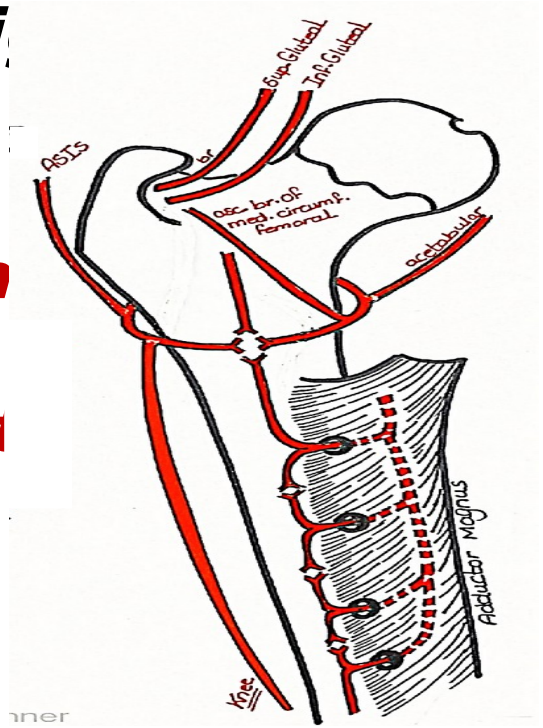
**2 . Asc. Br. of 1st perforat**
*(profunda fem)*

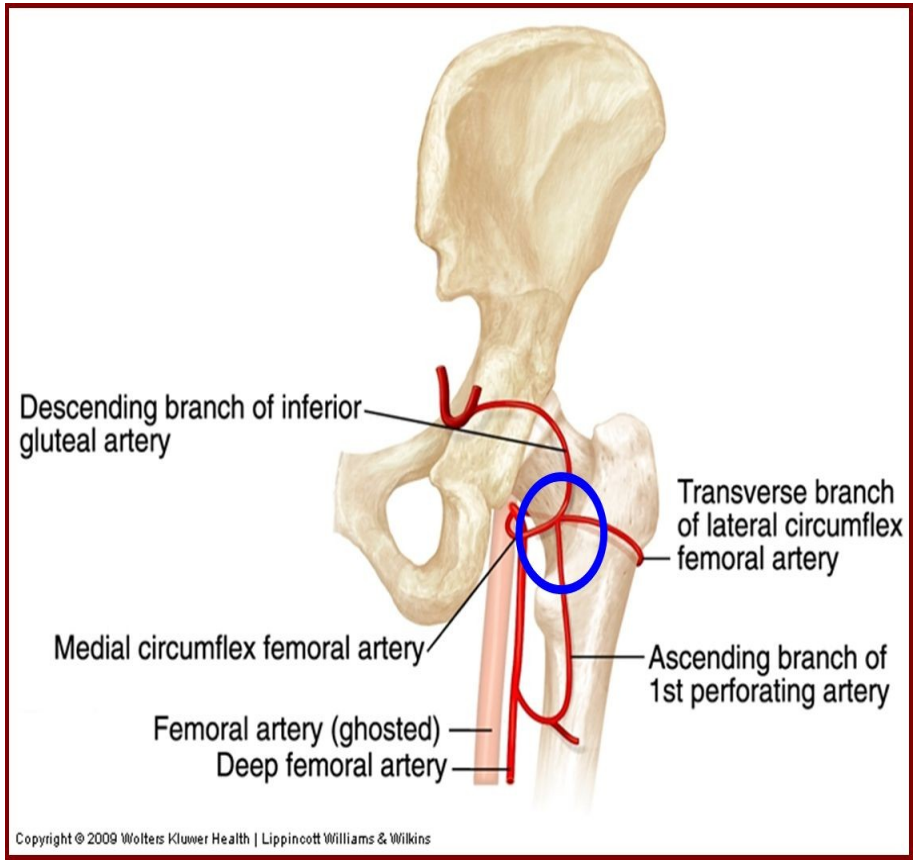
***Horizontal limb.**

1. **Transverse br. of med femoral A.**
2. **Transverse br. of lat circumflex femoral A.**
*(profunda fem)*

- **Clinical importance :**

**Connect femoral with internal iliac Art.**

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# Trochantric Anastomosis

- **Site:**

***In the trochanteric fossa***

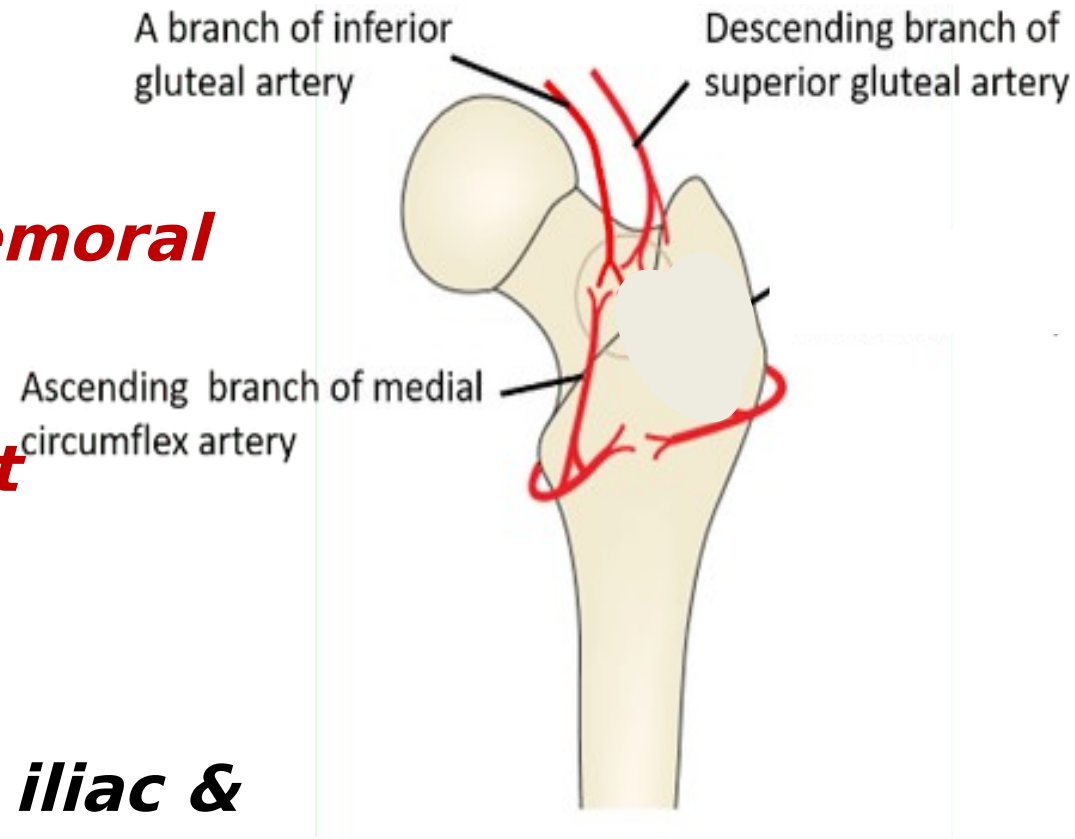
- **Formation:**

***1 . Asc. Br. of med circumflex femoral art.***

*(profunda fem)*

***2 . Br. from Sup & Inf gluteal art***

*(internal iliac)*

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- **Clinical importance :**

***Connect femoral with internal iliac & considered the main blood supply of neck of femur***

# Iliac Anastomosis

- **Site:**

**Around ASIS**

- **Formation:**

**1 . Superficial circumflex iliac art**

*(femoral)*

**2 . Deep circumflex iliac art**

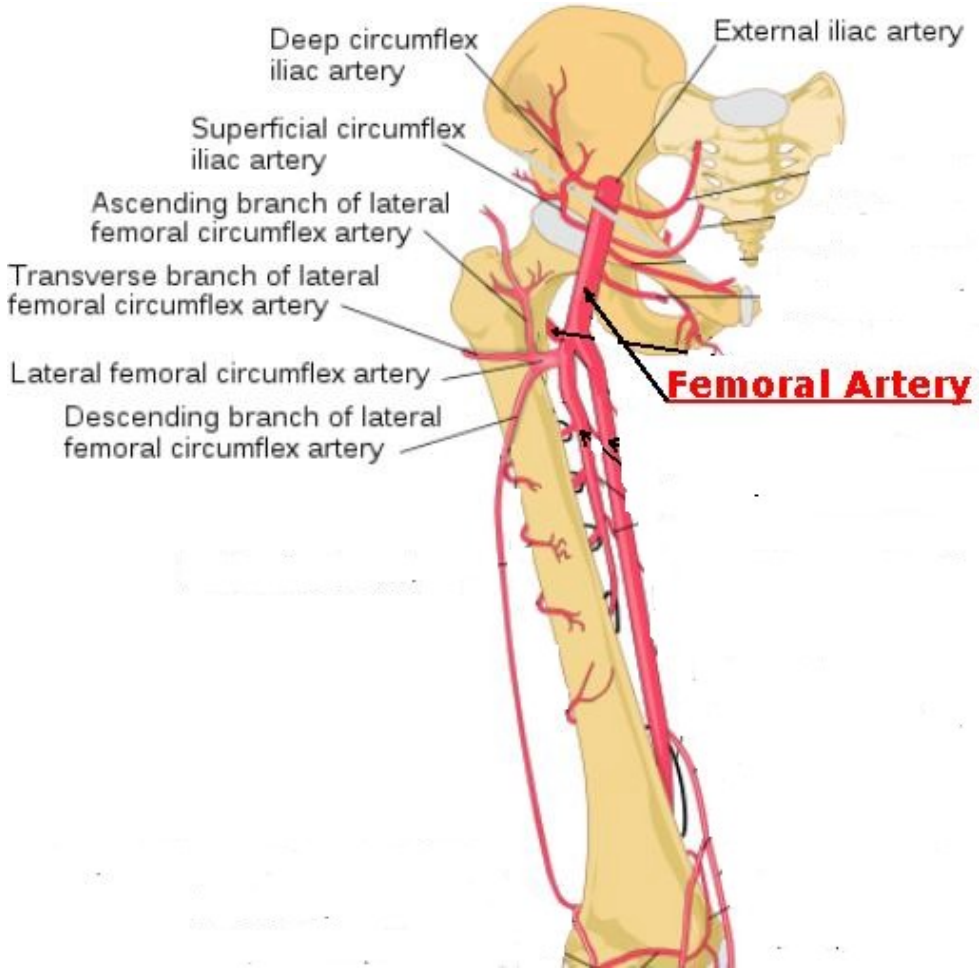
*(external iliac)*

**3 . Asc. Br. of lat circumflex femoral art.**

*(profunda fem)*

**4. Sup gluteal art**

*(Internal iliac)*

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- **Clinical importance:**

**Connect external & internal iliac arteries**

# Lecture Quiz

Question 1

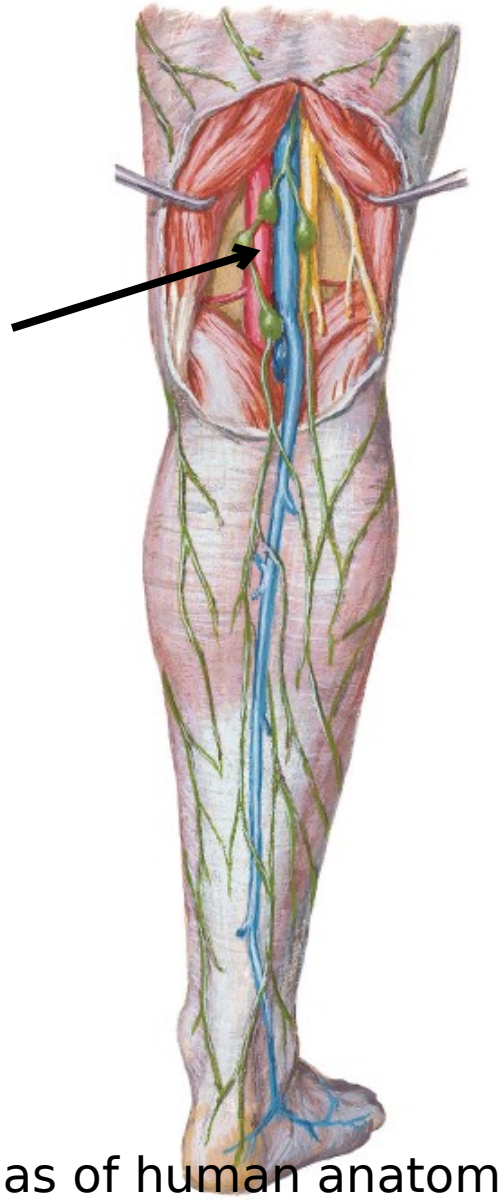
Enumerate arteries share in cruciate anastomosis

Question 2

The main blood supply of neck of femur is .....

# Popliteal artery

- ***Begins as*** *continuation of femoral artery at opening in adductor magnus*
- ***Ends at*** *distal border of popliteus by dividing into anterior and posterior tibial arteries*



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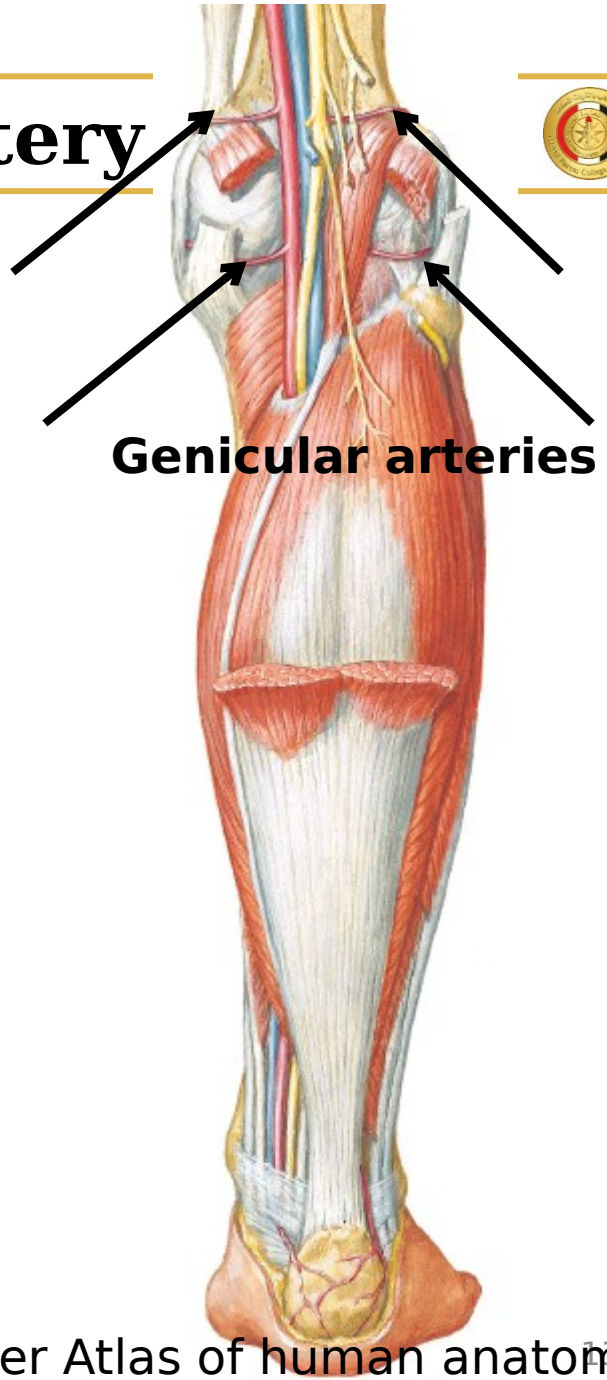
# Branches of popliteal artery

1. ***Muscular*** *(# with perforatings in chain #)*
2. ***Cutaneous***
3. ***Articular (Genicular) br.:***
   - *i. Sup. Med. Genicular a.*
   - *ii. Inf. Med. Genicular a.*
   - *iii. Sup. Lat. Genicular a.*
   - *iv. Inf. Lat. Genicular a.*
   - *v. Middle genicular: pierces the oblique popliteal ligament of the knee joint*

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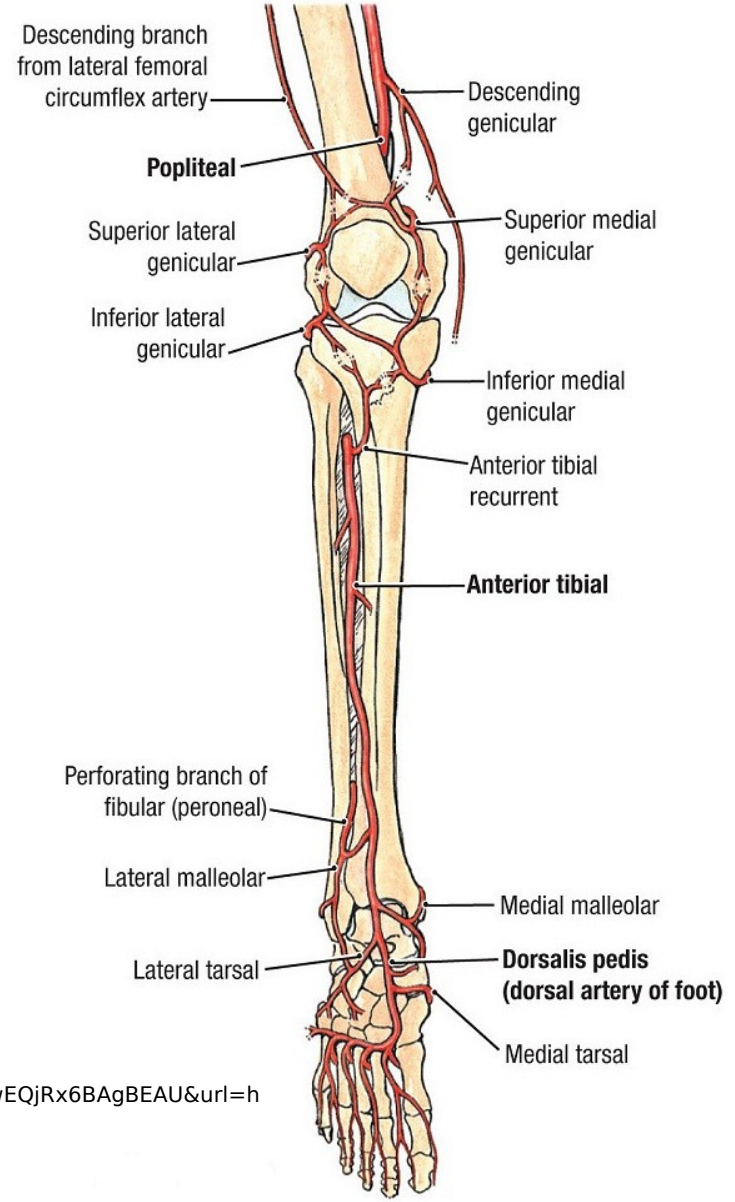
# Lecture Quiz

All of the following arteries share in the genicular anastomosis except:

a) Popliteal artery
b) Posterior tibial artery
c) Femoral artery
d) Profunda femoris artery

# Anterior tibial artery

- ***Begins as One of the 2 terminal brs. of the popliteal artery at distal border of popliteus***
- ***Ends as dorsalis pedis artery by passing in front of the ankle joint between 2 malleoli***
- ***passes through an opening in the interosseous membrane to reach the anterior compartment.***
- ***In lower part of leg it lies between extensor hallucis longus and extensor digitorum***

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# Branches of Anterior Tibial Artery

## Branches

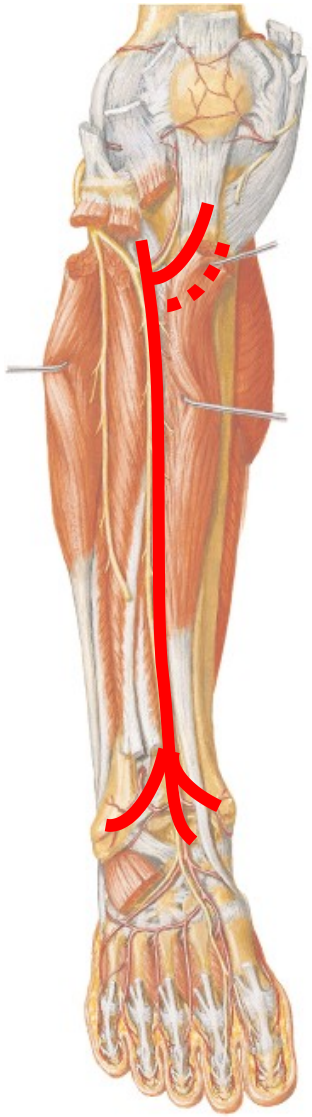
***1. Anterior and posterior tibial recurrent arteries*** .

*Share in anastomosis around knee*

***2. Muscular branches***

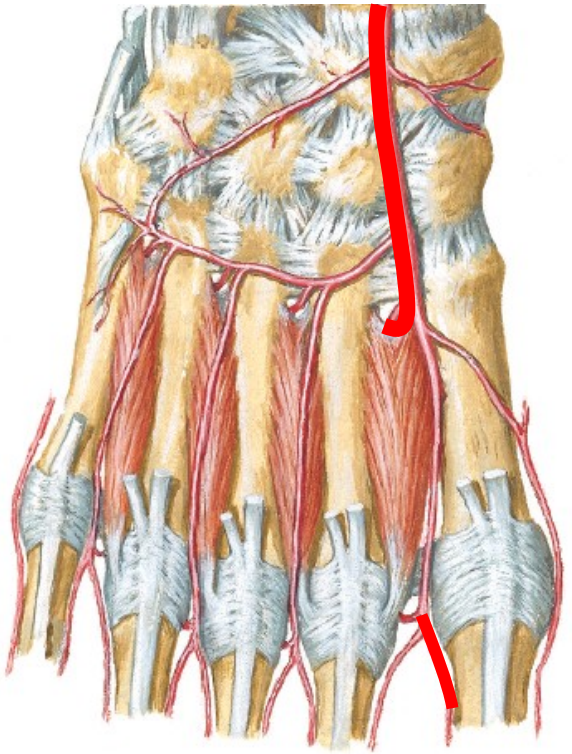
***3. Anterior medial and lateral malleolar arteries*** .

*Share in anastomosis around ankle*



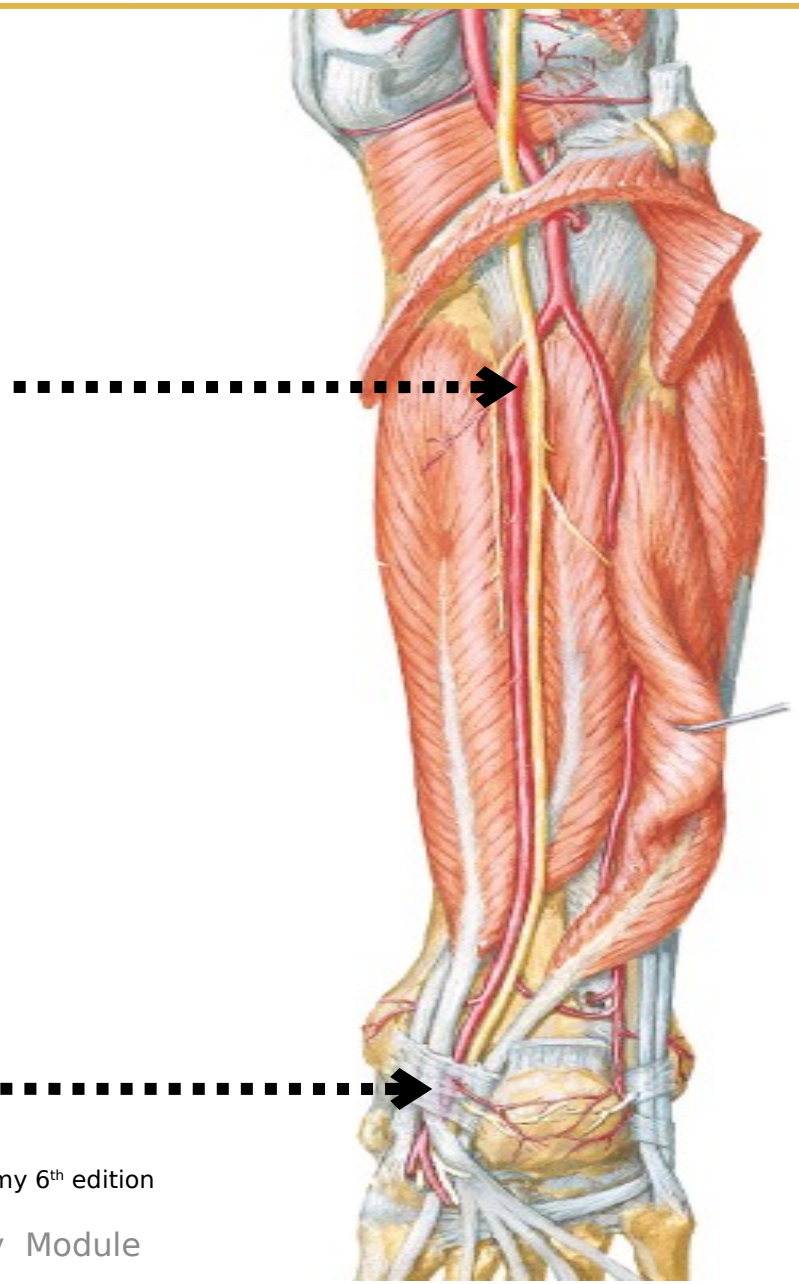
# Branches of Dorsalis Pedis Artery

1. ***Lateral & medial tarsal arteries***
2. ***Arcuate a.: gives 2nd ,3rd & 4th metatarsal a.***
3. ***1st dorsal metatarsal artery***



# Posterior tibial artery

- *It is the larger of the two terminal branches of the popliteal artery .*
- *It passes under the soleus*
- *It ends deep the flexor retinaculum by dividing into medial &lateral planter arteries.*



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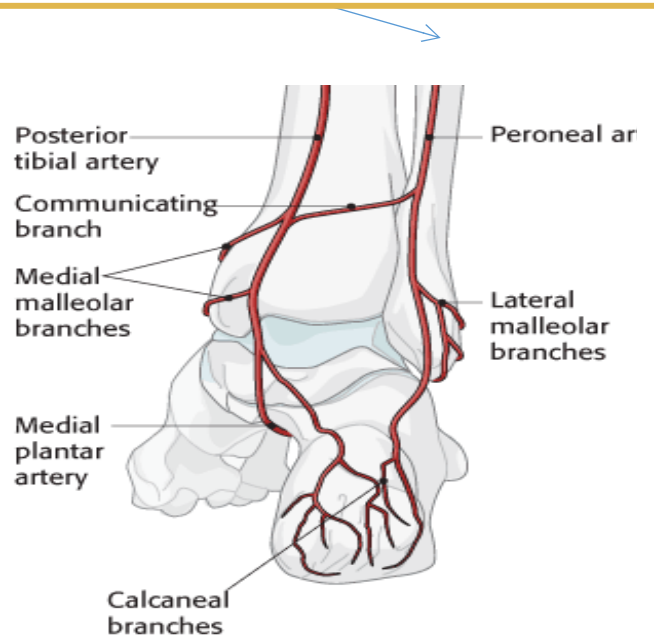
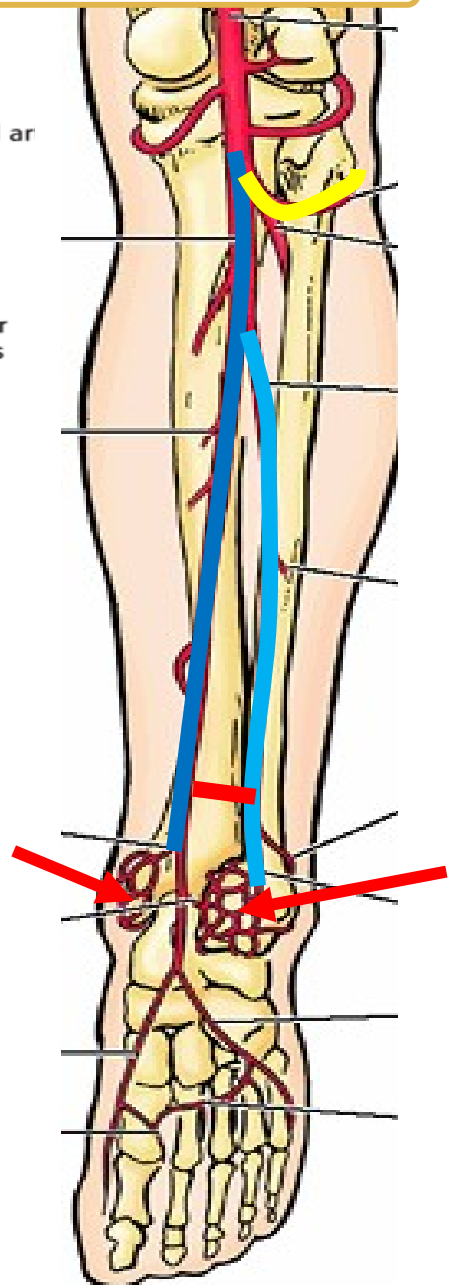
# Branches of posterior Tibial vessels

1. ***Peroneal artery:*** *Largest br., 1”below popliteus, descends along medial crest of fibula*
   - *i.Muscular.*
   - *ii.Nutrient: to fibula.*
   - *iii.Communicating: 2” above ankle.*
   - *iv.Perforating: 2” above ankle, # w lat. Malleolar, (**may replace dorsalis pedis artery**)*
   - *v. Calcanean: terminal br., # w lat. Malleolar*
2. ***Circumflex fibular:*** *# around knee.*
3. ***Muscular.***
4. ***Nutrient:*** *to tibia*
5. ***Communicating:*** *2” above ankle, joins that of peroneal a.*
6. ***Medial malleolar:*** *# around med. malleolus*
7. ***Calcanean:*** *# around med.malleolus*



# Genicular Anastomosis

## • Site:

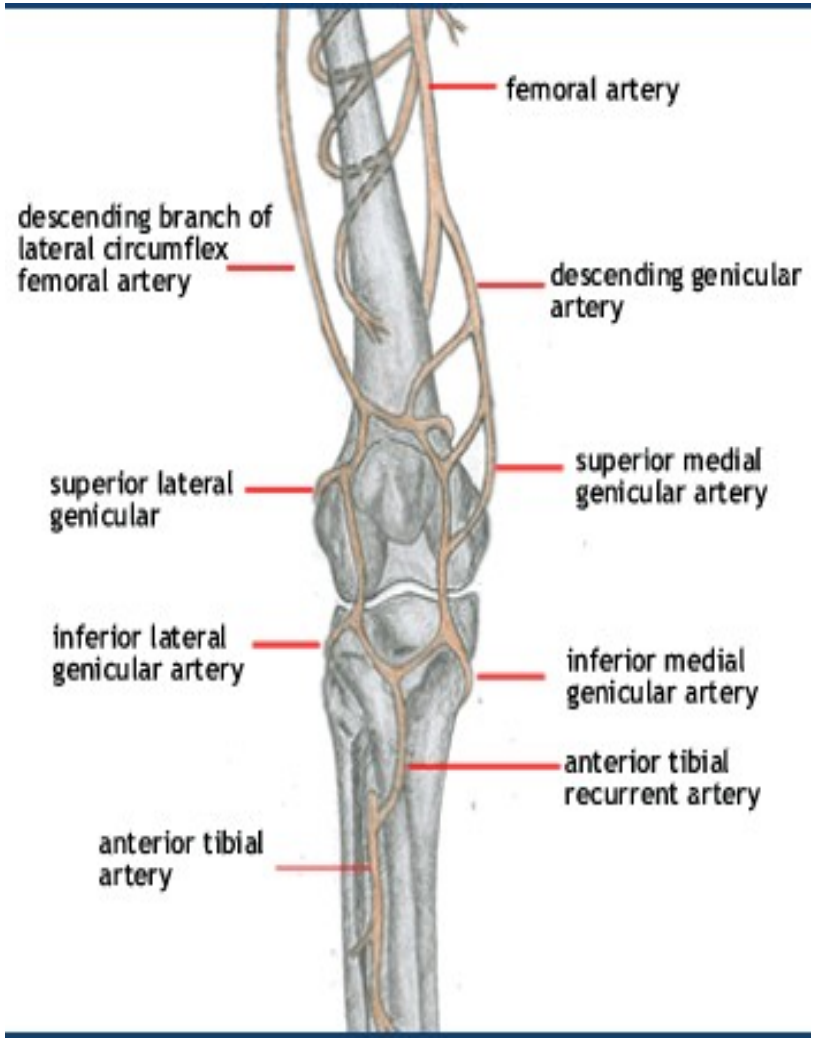
***Around knee joint***

## • Formation:

***1.Femoral A.: Descending genicular a.***
***2.Profunda: Descending branch of lat. Circumflex femoral***
***3.Popliteal A.: the 5 genicular arteries***
***4.Anterior tibial A.: Ant. & Post. Tibial recurrent arteries***
***5.Post. Tibial A.: Circumflex fibular***

## Clinical importance:

***compensate for the narrowing of the popliteal artery which occurs during flexion of knee***

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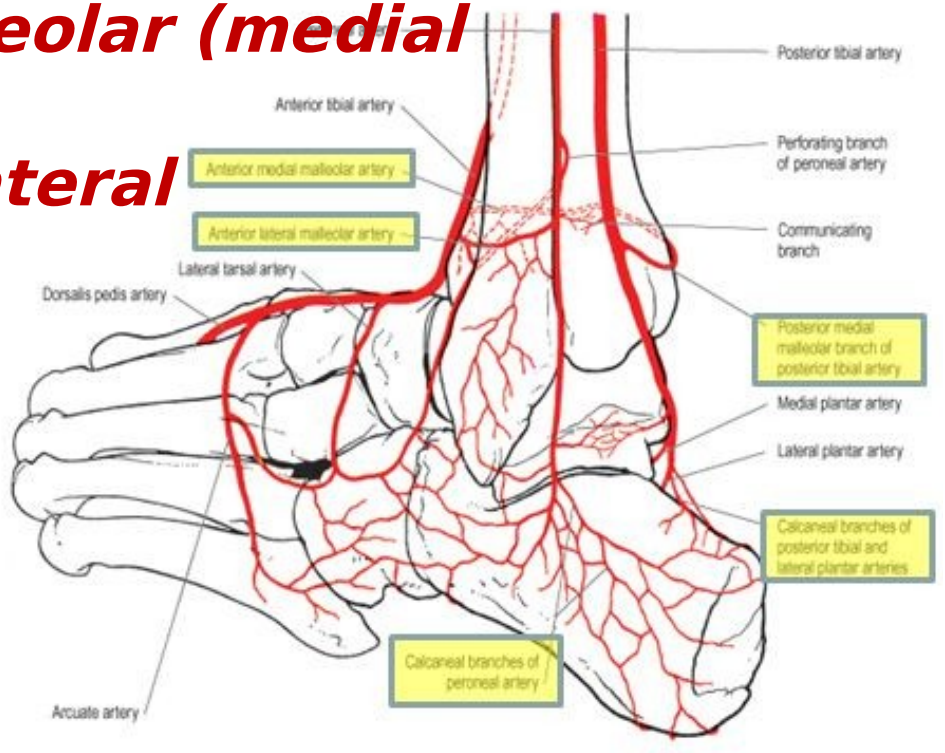
# Anastomosis around ankle

1. ***Ant. Tibial*: Ant. Medial malleolar & ant. Lat. Malleolar arteries**
2. ***Dorsalis Pedis*: Medial & lateral tarsal**
3. ***Post. Tibial A.*: Calcanean & medial malleolar (medial malleolus)**
4. ***Peroneal A.*: Perforating & calcanean (lateral malleolus)**

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# Clinical Application

***Arterial occlusive disease of the leg***
***→ Ischemia of the muscles***
***→ a cramp-like pain with exercise.***

***This condition is known as intermittent claudication.***

***If the arterial supply to the leg is occluded, gangrene will occur***


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Thank you!

# SUGGESTED TEXTBOOKS

1. Gray's Anatomy for Students-4th Edition

Atlas of human anatomy by Frank H. Netter, 6th Edition